

## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

As a preliminary matter, Applicant notes the Office Action's acceptance of the drawings filed on December 14, 2005, acknowledgement of Applicant's claim for foreign priority under 35 U.S.C. § 119(a)-(d), receipt of all certified copies of the priority documents and consideration of the Information Disclosure Statement also filed on December 14, 2005.

The abstract stands objected to for not being in the proper format and for not using the proper language. Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,360,679 to Buswell et al. (hereinafter "Buswell"). Claims 2-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Buswell in view of U.S. Patent No. 5,985,474 to Chen et al. (hereinafter "Chen").

By this amendment, the abstract has been amended to be placed in proper form. Withdrawal of the objection to the abstract is respectfully requested. Claims 1 and 2 have been amended to further define the subject matter Applicant regards as the invention with the amendments to claim 1 being discussed in greater detail below. Claims 3-5 remain unchanged in the application.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. After amending the claims as set forth above, claims 1-5 remain pending in this application for consideration.

Applicant respectfully submits that the claims are patentably distinguishable over the cited references as required by §103. Applicant further submits that none of the cited references, whether considered alone or in combination, discloses, teaches or suggests Applicant's claimed fuel cell cogeneration system including: (1) ***a hot water storage device for storing hot water and recovered heat recovered by the hot water via a heat exchanger from cooling water supplied to the fuel cell to be used to cool the fuel cell and discharged***

*from the fuel cell; (2) a thermometer for measuring a temperature of the hot water storage device; (3) a control device receiving a temperature signal from the thermometer for performing control to use heated gas composed of at least either the combusted exhaust gas or the cathode off gas as a heat source for the oxidant gas humidifying device when a temperature of the hot water storage device is lower than a predetermined value; (4) wherein the hot water is circulated through the hot water storage device and the heat exchanger; and (5) wherein the hot water, the cooling water, and the recovered water are isolated from each other* as now required by amended independent claim 1. By contrast, the cited references fail to disclose, teach or suggest these claimed features and arrangements. Accordingly, independent claim 1 and claims dependent therefrom are patentably distinguishable over the cited references. This distinction will be further described below.

### **THE CLAIMS DISTINGUISH OVER THE CITED REFERENCES**

Claim 1 stands rejected as being unpatentable over Buswell and claims 2-5 stand rejected over Buswell and Chen. Applicant respectfully traverses the rejections of these claims, and submits that these claims are allowable for at least the following reasons.

The framework for the objective analysis for determining obviousness under §103 requires:

1. Determining the scope and content of the prior art;
2. Ascertaining the differences between the claimed invention and the prior art;
3. Resolving the level of ordinary skill in the pertinent art; and
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

*Teleflex, Inc. v. KSR Int'l Co.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). In order to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). See MPEP §2143.03.

The Cited References Do Not Suggest All Claim Recitations

The cited references do not meet one of the requirements of MPEP § 2143, which is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

Embodiments of the present invention are directed to a fuel cell cogeneration system. The fuel cell cogeneration system according to independent claim 1 includes a reforming device, an oxidant gas humidifying device, a fuel cell, a hot water storage device and a thermometer. The reforming device reforms raw material fuel to generate reformat and the oxidant gas humidifying device takes in recovered water recovered from the reformat and oxidant gas, humidifying the oxidant gas with the recovered water, and discharging the oxidant gas. The fuel cell generates electricity through an electrochemical reaction between the generated reformat and the discharged oxidant gas, where anode off gas and cathode off gas are generated from the generated reformat and the discharged oxidant gas, respectively. The reforming device takes in and combusts the anode off gas to generate combusted exhaust gas

According to one embodiment of the present invention as now required by amended independent claim 1, (1) *the hot water storage device stores hot water and recovered heat recovered by the hot water via a heat exchanger from cooling water supplied to the fuel cell to be used to cool the fuel cell and discharged from the fuel cell*; (2) *the thermometer measures a temperature of the hot water storage device*; (3) *the control device receives a temperature signal from the thermometer for performing control to use heated gas composed of at least either the combusted exhaust gas or the cathode off gas as a heat source for the oxidant gas humidifying device when a temperature of the hot water storage device is lower than a predetermined value*; (4) *the hot water is circulated through the hot water storage device and the heat exchanger*; and (5) *the hot water, the cooling water, and the recovered water are isolated from each other*. Support for these amendments to independent claim 1 can at least be found on page 8, line 24 through page 9, line 10 and page 10, lines 9-22 of the present specification. With these features and arrangements, the water quality of the hot water can be separately controlled since the hot water is separate from the

cooling water and the recovered water, which leads to a high system operation rate in addition to a high electricity generation efficiency and a high waste heat recovery efficiency. (Specification, page 2, lines 15-17). Also, the fuel cell can be continuously cooled with the cooling water and the waste heat from the fuel cell can be continuously recovered, which further leads to a high system operation rate in addition to a high electricity generation efficiency and a high waste heat recovery efficiency (Specification, 4, lines 16-21).

One exemplary embodiment of the present invention is illustrated in FIGS. 1 and 2, which shows a hot water storage tank 120 storing hot water 43, whereby a lower part of the hot water storage tank 120 is lower than a predetermined value (a value between 35 to 45°C), with the hot water 43 circulating through the hot water storage device 43 and heat exchange 114 and thermometer 124 measuring the temperature of the hot water storage tank 120. As illustrated, the hot water, the cooling water and the recovered water are isolated from each other and a control section 122 controls the switching of the open/close states of the three-way electromagnetic valves 126, 127 and 128 based on the temperature measured by the thermometer 124 (page 8, line 24 through page 9, line 6 and page 10, lines 9-14). Applicant respectfully submits that the cited references fail to disclose, teach or suggest these claimed features and arrangements as well as the benefits provided.

The Buswell reference is directed to a hydrocarbon fueled solid polymer fuel cell electric power generation system that converts chemical energy from gaseous and/or liquid hydrocarbon fuels to electrical energy using a low temperature solid polymer fuel cell stack (Buswell, column 1, lines 8-14). The Office Action alleges that Buswell discloses each of the features of independent claim 1 except for the control device performing control of the heat source of the oxidant humidifying device based upon a predetermined temperature. The Office Action then relies on what is believed to be known prior art to cure this deficiency. Applicant respectfully disagrees with the Office Action's characterization of the Buswell reference vis-à-vis the present claims.

The Office Action at page 3 equates Buswell's water tank 92 and coolant accumulator 198 to Applicant's claimed hot water storage device. Applicant respectfully submits that independent claim 1 has been amended to require *a hot water storage device for storing hot*

*water and recovered heat recovered by the hot water via a heat exchanger from cooling water supplied to the fuel cell to be used to cool the fuel cell and discharged from the fuel cell.* Buswell's water tank 92 and coolant accumulator 198 fail to qualify as the claimed hot water storage device because Buswell's tank and accumulator only store the recovered water and the cooling water and not hot water as now specifically required by the claim. Since Buswell fails to disclose, teach or suggest the claimed hot water storage device for storing hot water, Buswell also fails to disclose, teach or suggest the claimed *thermometer for measuring a temperature of the hot water storage device, the claimed control device receiving a temperature signal from the thermometer and the hot water being circulated through the hot water storage device and the heat exchanger.* There is absolutely no disclosure, teaching or suggestion of these claimed features and arrangements in Buswell.

As stated above, Buswell fails to disclose the hot water. As illustrated in FIGS. 1 and 2 of Buswell, the cooling water and the recovered water are not isolated from each other, but instead, they are mixed. Therefore, Buswell fails to disclose, teach or suggest *the hot water, the cooling water, and the recovered water are isolated from each other* as now required by the claim.

Applicant would like to point out that the Office Action's statement regarding Buswell not teaching that the control device performs control of the heat source of *the oxidant humidifying device* based upon a predetermined temperature is confusing. Claim 1 requires that the control device performs control of the heat source of *the hot water storage device* based upon a predetermined temperature. Buswell does not suggest this feature, and the Office Action identifies nothing in Buswell to the contrary. Instead, the Office Action merely asserts that one of skill in the art would have found it obvious to control the heat source of the oxidant humidifying device of Buswell using a predetermined temperature. It appears that the Office Action relies on common knowledge in the art, as is discussed and permitted in MPEP § 2144.03, to satisfy the first requirement of MPEP § 2143. However, Applicant notes that MPEP § 2144.03 allows an applicant "to traverse such an assertion," and that when an applicant does so, "the examiner should cite a reference in support of his or her position." (MPEP § 2144.03, second paragraph.) Absent a citation by the PTO of a reference that can be evaluated for all its teachings, Applicant hereby traverses the assertion that it

would have been common knowledge in the art that one of ordinary skill in the art would have known of the feature of claim 1. Applicant thus requests, relying on MPEP § 2144.03, that the PTO cite a reference and exactly identify where such a reference teaches the feature of claim 1, or else allow claim 1.

Even assuming arguendo that common knowledge regarding the predetermined temperature can be applied, the cited reference still fails to disclose, teach or suggest (1) *the hot water storage device stores hot water and recovered heat recovered by the hot water via a heat exchanger from cooling water supplied to the fuel cell to be used to cool the fuel cell and discharged from the fuel cell*; (2) *the thermometer measures a temperature of the hot water storage device*; (3) *the control device receives a temperature signal from the thermometer for performing control to use heated gas composed of at least either the combusted exhaust gas or the cathode off gas as a heat source for the oxidant gas humidifying device when a temperature of the hot water storage device is lower than a predetermined value*; (4) *the hot water is circulated through the hot water storage device and the heat exchanger*; and (5) *the hot water, the cooling water, and the recovered water are isolated from each other*. The Chen reference was relied upon to address various features recited in some of the dependent claims. Applicant respectfully submits that Chen also fails to disclose, teach or suggest the features and arrangements identified above and was not cited for that purpose.

In view of the fact that the cited references, whether considered alone or in combination do not disclose the claimed features and arrangements indicated above, these references cannot be said to render obvious the invention which is the subject matter of independent claim 1. Thus, independent claim 1 is allowable.

Since independent claim 1 is allowable, claims dependent therefrom, namely claims 2-5 are also allowable by virtue of their direct or indirect dependence from allowable independent claim 1 and for containing other patentable features. Further remarks regarding the asserted relationship between any of the claims and the cited references are not necessary in view of their allowability. Applicant's silence as to the Office Action's comments is not indicative of being in acquiescence to the stated grounds of rejection.

In sum, one of the requirements of MPEP § 2143 is not satisfied in the Office Action with respect to any of the claims rejected as obvious because the cited references do not teach each and every element of the present invention. Thus, the present claims are allowable.

The Level of Ordinary Skill In the Art has Incorrectly Been Ascertained

*KSR* did not repeal the *Graham v. John Deere Co.* factors - just the opposite, it reaffirmed them. One of those factors is the requirement that the PTO must resolve the level of ordinary skill in the pertinent art. It is respectfully submitted that the PTO presumes a higher level of skill of the ordinary artisan in this art than was actually present at the time of the invention.

The ordinary artisan would not have had a level of skill sufficient to render the invention obvious to that ordinary artisan. Specifically, before the disclosure of the present invention, the ordinary artisan would not have had the skill to predict that the features of Buswell could be modified as is asserted in the Office Action. To the contrary, only the innovator would have had the skill necessary to predict such modification. The ordinary artisan would not have had the skills to arrive at the present invention without instruction from the innovator. The Office Action is silent in regard to addressing the requisite *Graham* factors.

Lack of Sufficiently Articulated Rationale to Modify or Combine the References

The Office Action fails to meet the requirement of providing a sufficiently articulated rationale to modify Buswell.

The Office Action cites no rationale or motivation, to modify Buswell to arrive at the feature recited in independent claim 1. All that the Office Action asserts is that it would have been obvious to control the heat source of the oxidant humidifying device of Buswell using a predetermined temperature in order to control the temperature of the humidification process to produce steam having the humidification level most desirable for a given set of operating conditions (but does not provide any evidence of such knowledge, as discussed above). If a showing of obviousness could be established based on mere knowledge of various elements

of a claim that are missing from a prior art reference, the first requirement of MPEP § 2143 would be completely eviscerated. Indeed, it is well established that innovation is often, if not usually, found in combining various elements of the prior art, hence the additional requirement to show motivation to combine/modify the prior art when rejecting a claim as obvious.

In rejecting the claim, the Office Action appears to rely on the alleged ease by which Buswell may be modified. The Examiner maintains that the heat source is controlled in order to control the temperature of the humidification process. However, the present invention does not control the temperature of the humidification process. According to the present invention, the heat sources are controlled so that the fuel cell can be continuously cooled with water and waste heat from the fuel cell can be continuously recovered. Thus, controlling the heat sources so that the fuel cell can be continuously cooled with the cooling water and waste the heat from the fuel cell being continuously recovered would result in Buswell's system not working properly.

Applicant respectfully submits that independent claim 1 and claims dependent therefrom are patentably distinguishable over the cited references and thus, allowable. Further remarks regarding the asserted relationship between any of the claims and the cited reference are not necessary in view of their allowability. Applicant's silence as to the Office Action's comments is not indicative of being in acquiescence to the stated grounds of rejection.

### **CONCLUSION**

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a



check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date February 27, 2009

By Michael D. Kaminski

FOLEY & LARDNER LLP  
Customer Number: 22428  
Telephone: (202) 672-5490  
Facsimile: (202) 672-5399

Michael D. Kaminski  
Attorney for Applicant  
Registration No. 32,904